THE ANNUAL REPORT

OF THE

DYKING COMMISSIONER

•FOR THE YEAR ENDING DEC. 31, 2000•

SUBMITTED TO:

The Hon. **Oscar Lathlin**

Minister

Conservation

SUBMITTED BY:

R. Hay P. Eng.

Dyking Commissioner

101-06430/

Water Resources Branch
Box 19 – 200 Saulteaux Crescent
WINNIPEG MB R3J 3W3
Phone: (204) 945-6496
Fax: (204) 945-7419

July 6, 2001

FILE: 11.1.5

The Honourable Oscar Lathlin
Minister
Manitoba Conservation
Room 333 Legislative Building
450 Broadway Avenue
WINNIPEG MB R3C 0V8

Dear Sir:

I have the privilege to submit, herewith, the Annual Report of the Dyking Commissioner as required under Section 13 of The Dyking Authority Act.

The annual report covers the appraisal of the Greater Winnipeg Dyking System and ancillary Pumping Stations for the 2000 calendar year, to determine its adequacy to provide flood protection for the City of Winnipeg. This year's report is being submitted well past the normal deadline of April 1st due to delays related to floodfighting preparations undertaken this past spring. A major component of the annual report consists of information provided by City of Winnipeg Water and Waste Department personnel, who were pre-occupied with activities associated with this spring's floodfighting and restoration operations. As Commissioner, I had considered the current level of maintenance of the system to be satisfactory and did not view a delay in the production of the annual report for 2000 as significant. Recommendations are included on page 6.

Please note that the Act does not require this report to be tabled in the Legislature.

Yours truly,

R. Hay, P. Eng.
Dyking Commissioner

RIAH/jb

Enclosure

THE ANNUAL REPORT

OF THE

DYKING COMMISSIONER

FOR THE YEAR ENDING

DECEMBER 31, 2000

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1 Acknowledgements

Evaluation of the adequacy of the dyking system is based mainly on reports provided by the staff of the City of Winnipeg and the University of Manitoba. Their cooperation in providing annual reports and technical advice is gratefully acknowledged.

2 The Dyking Authority Act of 1952

The Dyking Authority Act D110, passed in 1952, was intended to ensure that the dykes and pumping stations constructed subsequent to the 1950 flood were maintained in a state of readiness to combat future floods. In fact, the full title of the original Act was *An Act to Provide for the Maintenance of Dykes and Pumping Stations in Greater Winnipeg.*

While authority and control over dykes and pumping stations was vested with the city or rural municipality in which they were situated, provision was made for the appointment of a Dyking Commissioner with powers to inspect dykes and pumping stations and to order work to be undertaken to maintain an integrated system of flood defence as well as to establish the location of the line of defence.

The Dyking Commissioner is required to "before the first day of April in each year, make to the Minister a report on the administration and carrying out of the provisions of this Act during the year ending on the thirty-first day of December next preceding the making of the report, and on the condition of the dykes, pumping stations, and pumps, and their sufficiency for the purposes for which they were constructed or installed.

3 Changes Since 1952

Several major changes have taken place since the passing of The Act in 1952.

1. Major flood control projects affecting the City of Winnipeg namely the Red River Floodway, Portage Diversion and Shellmouth Dam projects have been completed.

2. Urban development has taken place beyond the lines of flood defence established earlier.

3. The five cities and two rural municipalities subject to The Act have been replaced by a single city.

4. Under the Canada-Manitoba Flood Damage Reduction Agreement, Interim Flood Risk Maps designating Flood Risk Areas and Floodways in the City of Winnipeg were produced in 1980 and flood protection criteria for developments dictated by flood levels were defined.

5. The City of Winnipeg Act was amended in 1981 to recognize the designated flood risk areas and the criteria for development in flood prone areas.

6. As of January 1, 1992 the Designated Floodway Fringe Area Regulation 266/91 requires the Primary Dyke to be located, designed and constructed to the standard and elevation approved by the City Administrator and the Dyking Commissioner .

4 Current Issues and Actions

Changes to legislation and the dynamics of urban development give rise to issues from time to time. Present issues are:

1. Flood defence lines are continually requiring revisions to accommodate the effect of flood control/protection works and the impact of on-going urban development.

   The City is continuing to review the Primary Line of Defence (PLD) for re-designation and extensions. Plans are being prepared and submitted to the Dyking Commissioner for approval. Some preliminary proposals have been reviewed with the Commissioner as noted in the City of Winnipeg report in Appendix D.
   The City has completed new maps of the primary dykes on an electronic medium database. In addition to mapping the 115 kms of primary dykes, these drawings also identify deficiencies in the primary dyking system, the required quantity of fill material to raise the dykes to the required protection levels and the location of the sewer manholes, catch basins, outfalls and control chambers through the dyke. Areas where the PLD must be re-aligned to accommodate new development are also included.

2. Since the 1997 "Flood of the Century", a number of initiatives have been undertaken with respect to enhancing the level of flood protection for the City. All have implications for future administration of The Dyking Authority Act.

   i) The International Joint Commission (IJC) initiated comprehensive studies of the City's flood defence systems that identified vulnerabilities and proposed strategies for flood risk reduction. The final report, entitled " Living with the Red", was issued in December of 2000. The Report contained several conclusions of which the following perhaps bears most significantly on the future of the Primary Dyking System in Winnipeg: "Under flow conditions similar to those experienced in 1997, the risk of a failure of Winnipeg's flood protection infrastructure is high. Public safety requires that the city, province and Canadian federal governments focus immediate attention on designing and implementing measures to further protect Winnipeg."
   -A consultant has been engaged to further assess the leading alternative for significantly enhancing the level of flood protection for the City, namely, expansion of the Red River Floodway. This work is anticipated to provide information sufficient to enable the senior levels of government to embark on negotiations related to planning and funding the substantial physical works required to significantly improve Winnipeg's chances of avoiding future major flooding disasters.

The IJC also endorsed several recommendations of its own task force, specifically;

-Recommendation #7- "The Primary Dyking system for Winnipeg should be raised where economically feasible to the elevation specified in existing legislation."
There remain several locations within the City where the designated primary line of defence is slightly below the Flood Protection Level for short distances. The City has identified these reaches for permanent upgrading as programming allows.

-Recommendation #10- "Modifications to the sewer and land drainage systems of Winnipeg should be optimized and undertaken once the overall plan for Winnipeg flood protection is determined."
The City has identified and scheduled the required works for future infrastructure plans. There are several components of this work that can be implemented at any time. They are independent of the overall design standard to be selected for enhancing the level of flood protection for the City.

-Recommendation #11- "The city should give immediate high priority to the preparation of a detailed emergency preparedness and response manual".
Work is currently underway on the preparation of a detailed Flood Activity/Emergency Operations Manual for the City's flood protection infrastructure.

ii) The City has entered into an agreement with both the federal and provincial governments to provide enhanced secondary flood protection works (i.e. outside the Primary Line of Defence). The agreement, whose term currently extends to March 31, 2003, provides a total of $11.1 M for upgrades to both individual property site flood protection and community ring dykes within the City Limits. The Dyking Commissioner is a member of the Technical Advisory Committee coordinating the implementation of the agreement, as several of the proposed works lie within the designated Floodway Fringe of the Red River.

iii) Further to a recommendation from the Manitoba Water Commission-June 1998 Report, the Province presided over a committee established to review the operating rules for the Red River Floodway. The ad hoc Floodway Operation Review Committee (FORC) was comprised of representatives from Manitoba Water Resources Branch, the Federal government (PFRA), the City of Winnipeg and the Rural Municipal Councils of the three municipalities immediately upstream of the Floodway Inlet. The Committee's final report was entered on the public registry. The report's recommendations have received federal government ratification. In addition, the federal government is preparing legislation which, when

passed, will remove the present requirement for Canada's approval of changes to the operating rules for the Floodway. Manitoba proceeded to establish, as recommended, the annual Red River Floodway Operation Advisory Board to oversee the determination of the Inlet Structure gate settings for the spring runoff of 2001. It is anticipated the revised Rules of Operation will be included in the next report of the Dyking Commissioner.

5 Inspection of Facilities

The City of Winnipeg and the University of Manitoba have ongoing inspection and maintenance programs. The programs for 2000 are described in detail in the reports under Appendix D.

I have been impressed with the degree of care which the City and University apply to the maintenance of their respective flood protection facilities.

6 Reports by the City of Winnipeg and the University of Manitoba

A questionnaire was sent to the City and to the University requesting information for the purpose of preparing this report. A copy of the request and questionnaire is included in Appendix C. The replies to the questionnaire, included in Appendix D, indicate that regular monitoring, detailed inspections and necessary maintenance work was carried out.

7 Primary Dyking System

1. Pumping Stations and Gates

Normal annual maintenance activities were undertaken on the pumping stations and gate chambers in 2000. Operational activities, on the other hand, were somewhat unusual for 2000. Relatively low spring run-off flow conditions resulted in no requirement to operate the gates or flood pumping stations during the spring. However, extraordinarily high precipitation on the upper Red River basin in early July and again late in October required the activation of the gates and pumping stations for most of July and November/December.

The City's Water and Waste Department continued to upgrade the lift station alarm and monitoring systems and flap and positive gate configurations at the automated stations. Specifically, two of the permanent pumping stations were upgraded with new flap gate/chambers. The University of Manitoba completed repair

and modifications of a separated discharge line from their number one outfall and began construction of a new sewer outfall gate structure. The specific details of these programs are outlined in the attached Appendix D.

2. Primary Line of Defence

As previously mentioned, the Red River produced no high water event during the spring of 2000. Summer and late fall peaks were experienced however, 15.6 feet James datum on July 8th and 9th and 12.9 feet James datum on November 14th thru 16th. Although no dyke closure or raising operations were implemented with respect to the primary or secondary dykes, the "Forks" river walkway was inundated for substantial periods during both events. Operations were confined to normal gate closures and sewer pumping.

8 Additional Works Constructed

No major additional works were undertaken in 2000. Planning and construction scheduling is well underway for two projects involving modifications to the Primary Line of Defence, namely, Waterfront Drive and the new Provencher Bridge.

9 Recommendations

It is recommended that:

1. the City of Winnipeg accelerate it's efforts to complete all necessary rehabilitation and upgrading to the primary dykes, pump stations, gates and outfalls through the primary dyke, to improve the integrity of the system. The Dyking Commissioner notes that the City has undertaken approximately $5 million in flood mitigation work since 1997, and has an additional $26 million included in their 2001-2006 capital program. There remains identified however, a further $141 million in works to be undertaken beyond 2006. The City did not advance any flood protection related infrastructure in their priority listing for the proposed cost-shared 2001-2006 Canada/Manitoba Infrastructure Program.

2. the City of Winnipeg, with the assistance of the Dyking Commissioner, ensure that permanent modifications to the secondary dykes do not detrimentally impact the Designated Floodway of the Red River channel, the primary dykes or local drainage outlets.

10 Appendix A

City of Winnipeg
List of Flood Pumping Stations and Gate Chambers

CITY OF WINNIPEG FLOOD CONTROL FACILITIES - 2000

FLOOD PUMPING STATIONS:

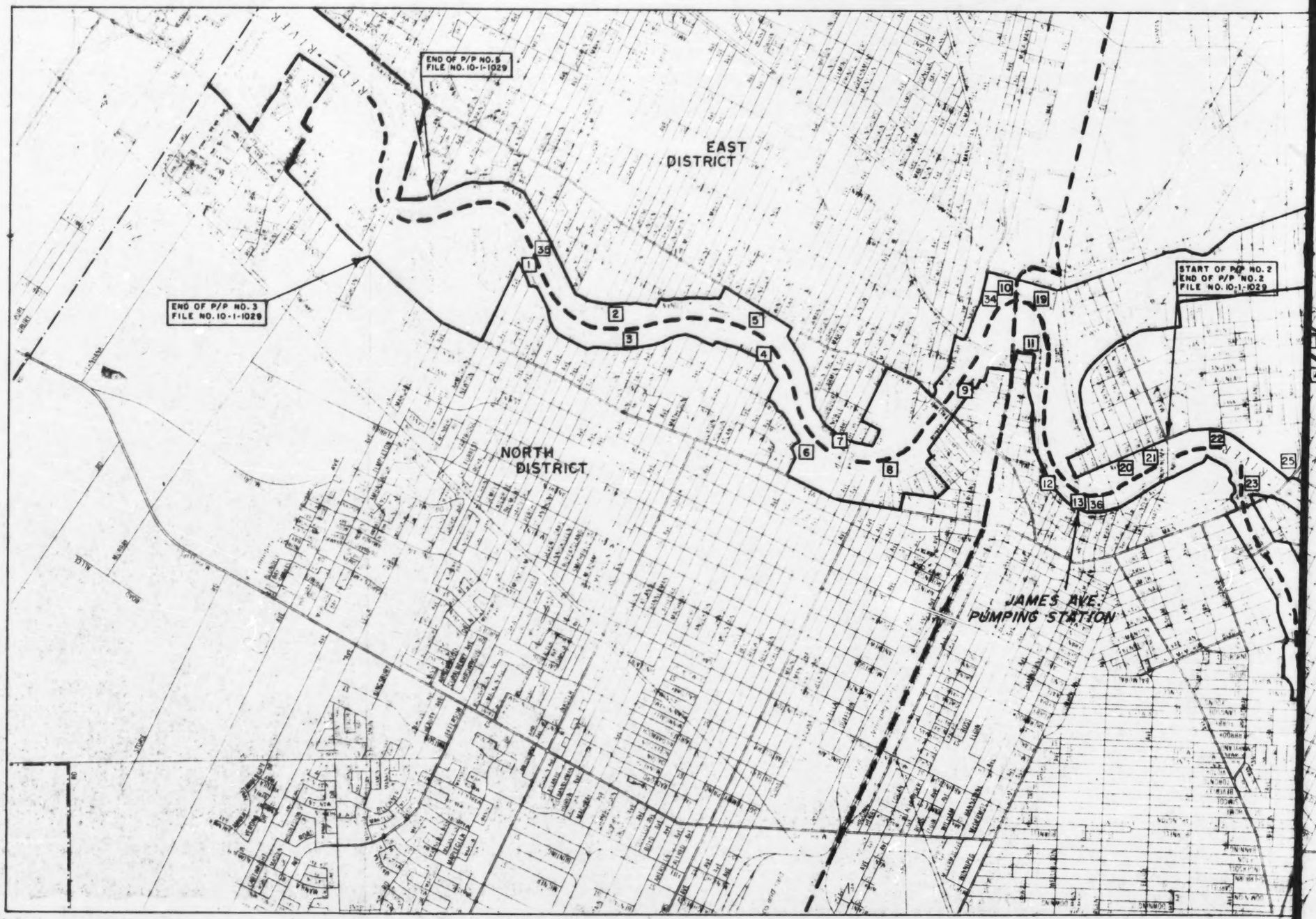
1 Newton
2 Linden
3 Jefferson
4 Polson
5 Monroe
6 St. John
7 Hart
8 Selkirk
9 Syndicate
10 Archibald Underpass
11 Galt
12 Assiniboine
13 James Avenue
14 Assiniboine
15 Colony
16 Cornish
17 Aubrey
18 Clifton
19 Mission
20 Laverendrye
21 Dumoulin
22 Despins
23 Mayfair
24 Ash
25 Marion
26 Jessie
27 Metcalf
28 Baltimore
29 Mager Drive
30 Cockburn
31 Ferry
32 Turnbull Drive
33 St. James Underpass
34 Roland
35 Larchdale
36 Bannatyne

GATE CHAMBERS:

Rainbow Stage
St. Mary's Road
Armstrong
Ft. Rouge Park
Maryland
Renfrew
St. Norbert X-Kalay
Eccles (new 1200mm SRS)
Wildwood Golf Course
X-Kalay Drive Culvert
Darcy @ Glengarry
Crane @ Southdrive (WWS)
Kilkenny N. of Radcliffe
N.E. Interceptor
Ruby
Pembina & Crane
Aubrey (Storm)
Kingston Row CSO
Trappiste @ Pembina
Assiniboine E.
Assiniboine W.
Burrows
Calrossie @ Riverside
Ducharme @ Villineuve
Eccles (old 750mm SRS)
Kilkenny & Rice
Lombard
McDermot
Spence
Somerset @ Riverside
Bredin Drive
Canora
Guay
Churchill Drive Underpass
Churchill High School
Bredin Drive
Chataway
Deer Lodge Place
Douglas Park
Ferry Road
Kildonan Park
Lemay & Lord
Olive Street
Conway
Cranestorm
Donald Street
Dowker Outfall
Osborne @ St. Vital Bridge G.C.
Hargrave Street
Inkster
Kennedy
Kingston Row Underpass
Riviera Crescent Outfall
Water Avenue
Clarence & Hamlin
Colony
Dieppe
Hawthorne
Parkside 30"
Parkville
Sommerville & Beaumont
St. Boniface Hospital MH
Kildare
Riverdale
McLeod Cr. & Kildonan Cor.
Donacaster
Dunham Road
Plaza Drive
Pulberry
Seel & Fennel
Darcy 43 m N. of Glengarry
Glasgow
Summerview Lane
South St. Vital Ret. Basin
N. St. Boniface LDS
Shier Drive
Barker
Waverley Lakes
Arlington
Calrossie Outfall
Conway
Moore
Strathmillan
Wexford
Killarney
Rowandale
Ridgedale
River Point Pl.
Clifton Overflow (Omands Cr.)
Forks
Heritage
N.E. Interceptor Manhole
King Edward Storm
Kingston Row @ Elm Park
Riverbend 90"
Tylehurst
Lot 16 Gate
Fermor

11 Appendix B

City of Winnipeg Maps - Showing District Boundaries,
Flood Defence Lines and Pumping Station Locations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END OF P/P NO. 3
FILE NO. 10-1-1029
EAST
DISTRICT
NORTH
DISTRICT
START OF P/P NO. 2
END OF P/P NO. 2
FILE NO. 10-1-1029
JAMES AVE.
PUMPING STATION
35
1
2
3
4
5
6
7
8
9
10
34
11
19
12
13
36
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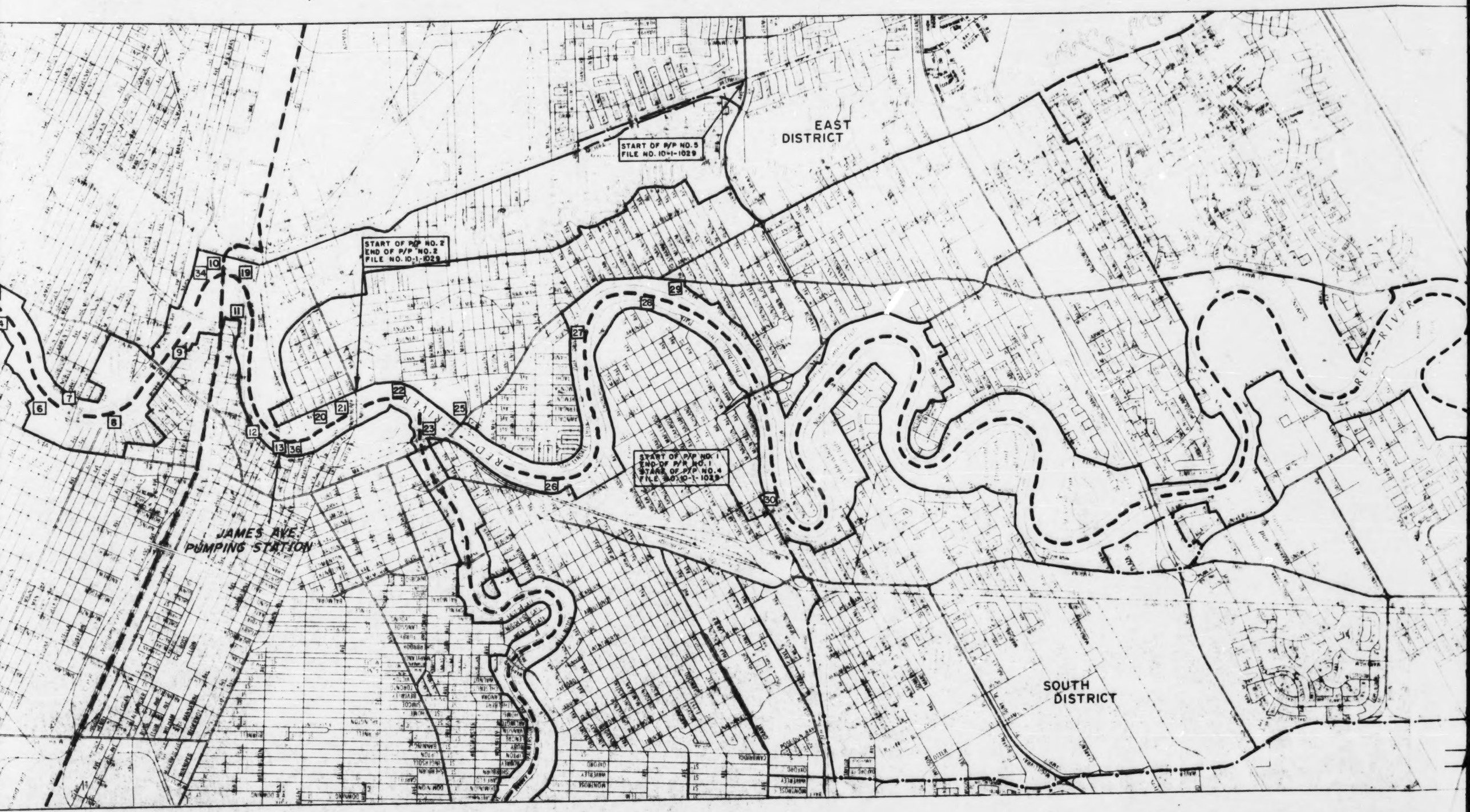
21
22
23
25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EAST
DISTRICT
START OF P/P NO. 2
END OF P/P NO. 2
FILE NO. 10-1-1029
START OF P/P NO. 1
END OF P/P NO. 1
START OF P/P NO. 4
FILE NO. 10-1-1029
JAMES AVE.
PUMPING STATION
SOUTH
DISTRICT
RED RIVER

WATER BRANCH

CITY OF WINNIPEG PRIMARY DYKE

DISTRICT BOUNDARIES
(FLD) FLOOD DEFENCE LINES
PUMPING STATION LOCATIONS

FILE NO 10 1 1039D SHEET 1 OF 2

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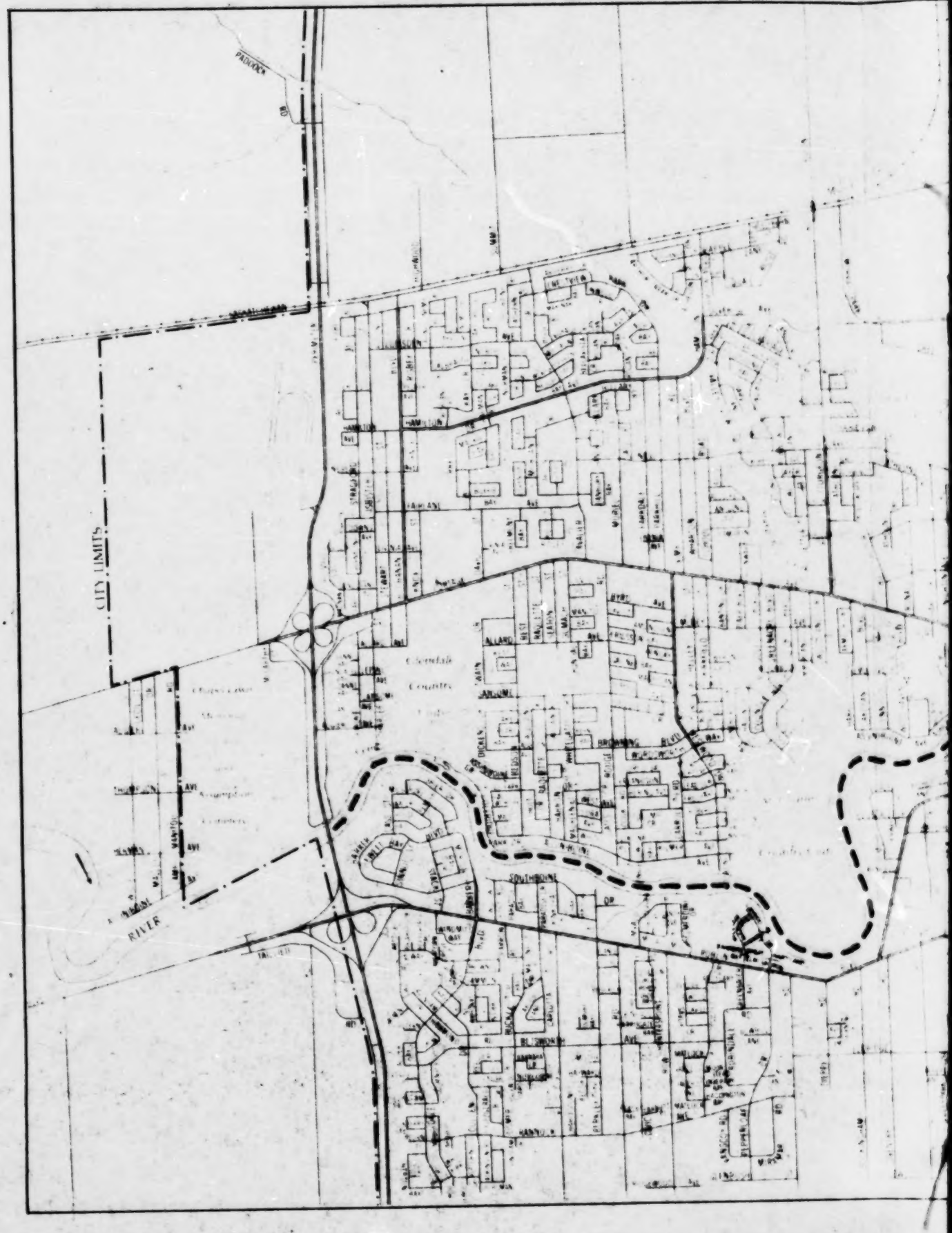
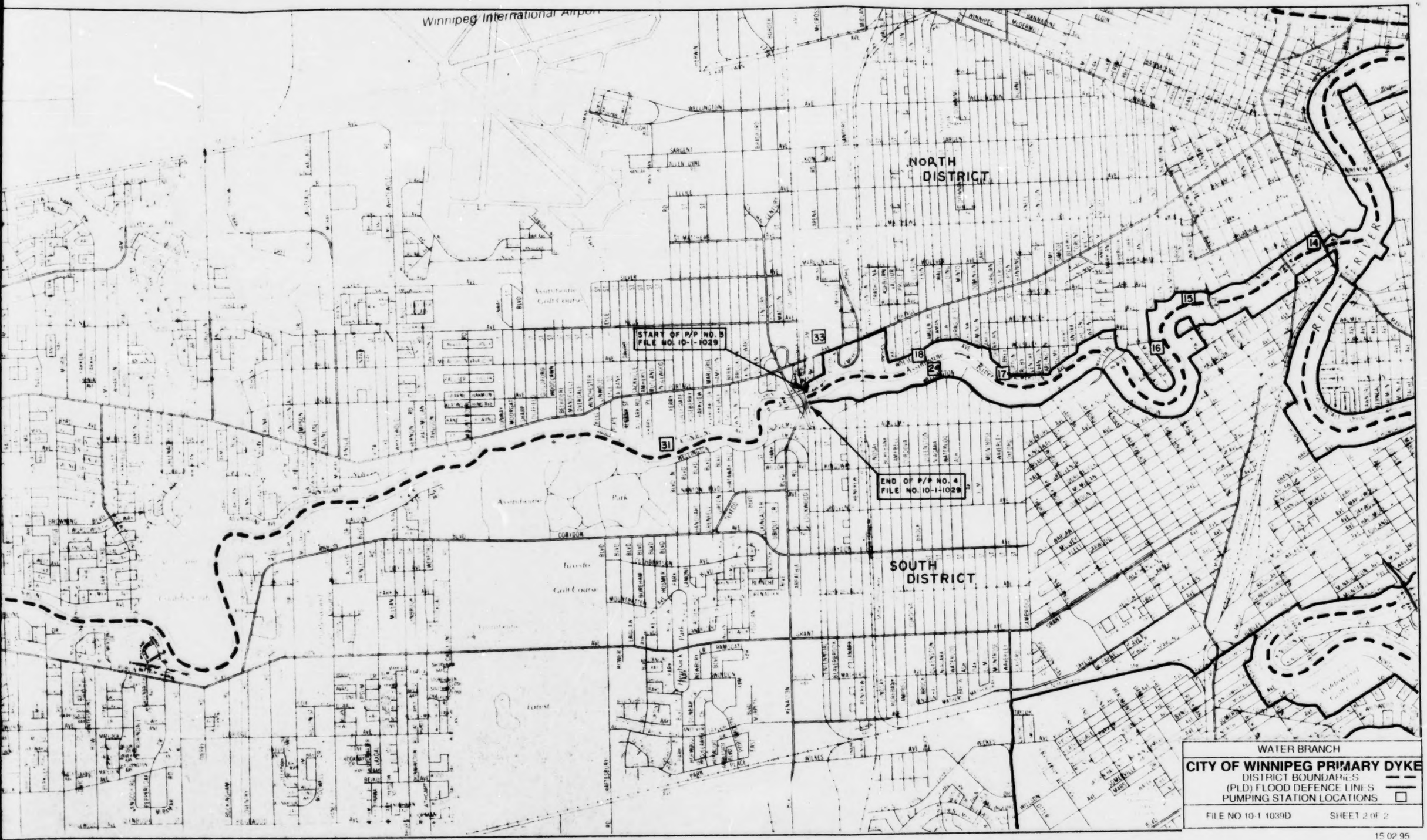

PADUCAH
RD
CITY LIMITS
RIVER



WATER BRANCH

CITY OF WINNIPEG PRIMARY DYKE

DISTRICT BOUNDARIES — —

(PLD) FLOOD DEFENCE LINES ——

PUMPING STATION LOCATIONS □

FILE NO 10-1 1039D SHEET 2 OF 2

15 02 95

12 Appendix C

Copy of Questionnaire to:

The City of Winnipeg
and
The University of Manitoba

Water Resources Branch
Box 19 - 200 Saulteaux Crescent
Winnipeg, Manitoba
R3J 3W3
Tel: (204) 945-6496
Fax: (204) 945-7419

January 8, 2001

File: 11.1.5

Ms. Debbie McCallum
Associate Vice-President
Ancillary & Physical Resources
208 Administration Building
University of Manitoba
WINNIPEG MB R3T 2N2

Dear Ms. McCallum:

RE: Dyking Commissioner's 2000 Annual Report

The Dyking Authority Act, Section 15, requires that:

> "The commissioner shall, before the first day of April in each year, make to the minister a report on the administration and carrying out of the provisions of this Act during the year ending on the thirty-first day of December next preceding the making of the report, and on the condition of the dykes, pumping stations, and pumps, and their sufficiency for the purposes for which they were constructed or installed."

To assist in making this report I request that you supply me with a report on the dyking system and pumping stations under your jurisdiction for the 2000 calendar year **by March 1, 2001**. For convenience, I am including a standard questionnaire similar to that used in previous years. Please accept my apology for the lack of notice this year. I remain confident your staff have anticipated the annual information request and already begun preparing the report.

Yours truly,

Rick Hay, P. Eng.
Dyking Commissioner

RIAH/jb

cc: Steven Topping, Director
Water Resources Branch

Enclosure

Water Resources Branch
Box 19 - 200 Saulteaux Crescent
Winnipeg, Manitoba
R3J 3W3
Tel: (204) 945-6496
Fax: (204) 945-7419

January 8, 2001

File: 11.1.5

Mr. Barry McBride
Director, Water and Waste Department
The City of Winnipeg
101 - 1155 Pacific Avenue
WINNIPEG MB R3E 3P1

Dear Mr. McBride:

RE: Dyking Commissioner's 2000 Annual Report

The Dyking Authority Act, Section 15, requires that:

> "The commissioner shall, before the first day of April in each year, make to the minister a report on the administration and carrying out of the provisions of this Act during the year ending on the thirty-first day of December next preceding the making of the report, and on the condition of the dykes, pumping stations, and pumps, and their sufficiency for the purposes for which they were constructed or installed."

To assist in making this report I request that you supply me with a report on the dyking system and pumping stations under your jurisdiction for the 2000 calendar year **by March 1, 2001**. For convenience, I am including a standard questionnaire similar to that used in previous years. Please accept my apology for the lack of notice this year. I remain confident your staff have anticipated the annual information requirement and have already begun preparing their reports.

Yours truly,

Rick Hay, P. Eng.
Dyking Commissioner

RIAH/jb

cc: Steven D. Topping, Director
Water Resources Branch

Enclosure

QUESTIONNAIRE FOR THE ANNUAL REPORT ON THE PRIMARY DYKING SYSTEM WITHIN THE CITY OF WINNIPEG

1. For the Reporting Year

Please provide information concerning:

a) Difficulties and problems encountered.

b) Maintenance and repairs carried out.

c) New Sewer Outfall Gate Structures constructed.

d) Improvements and modifications carried out.

2. Proposed Plans for Future

Please provide information concerning proposed new structures, modifications to existing structures, and proposed improvements or additions to the dyking system. Also note any evaluation studies completed or underway in connection with the "Primary Dyking System".

Further, in view of the apparent river bank stability problems, please provide information in regard to:

a) Evaluation of river bank stability in critical areas.

b) Monitoring erosion of river banks in critical areas.

c) Any remedial works undertaken or completed in the reporting year.

3. Availability and Location of Proposed Borrow Pits

Indicate changes if any in availability and location of proposed borrow pits in the reporting year.

13 Appendix D

Replies to Questionnaire

UNIVERSITY OF MANITOBA

PHYSICAL PLANT

89 Freedman Crescent
Winnipeg, Manitoba
Canada, R3T 2N2

FAX: (204) 474-7547

January 12, 2001

Mr. Rick Hay, P. Eng.
Dyking Commissioner
Water Resources Branch
Box 19 - 200 Sauteaux Crescent
Winnipeg, Manitoba
R3J 3W3

Dear Mr. Hay:

Subject: **Dyking Commissioner's 2000 Annual Report**

The following is in response to the questionnaire for the Annual Report on the Primary Dyking Systems within the City of Winnipeg.

1. **2000 Calendar Year**

a) Difficulties and problems encountered. None

b) Maintenance and repairs carried out.

A section of discharge pipe from outfall #1 is scheduled to be replaced in late January or early February 2001. This was necessary due to a section being crushed when the remedial work was done in early 2000.

c) New Sewer Outfall Gate Structures constructed.

The new outfall for SMARTpark was completed in the spring of 2000.

d) Improvements and modifications carried out.

None

2. **Proposed Plans for Future**

There are no further plans for new structures or modifications at this time.

a) Evaluation of river bank stability in critical areas.

There are no evaluation studies underway or planned at this time.

b) Monitoring erosion of river banks in critical areas.

Monitoring of riverbanks is conducted regularly at 13 river bank locations. There was no significant erosion detected during 2000.

c) Any remedial works undertaken or completed in the reporting year.

As noted in #1, questions b). and c).

3. **Availability and Location of Proposed Borrow Pits.**

No changes are suggested in the availability or location of proposed borrow pit for 2001.

Yours truly,

Brian J. Rivers
Director of Physical Plant

bjr/nl

cc: Mr. M. McAdam, Vice-President (Administration)
Mrs. D. McCallum, Associate Vice-President (Administration)

Winnipeg

Water and Waste Department o Service des Eaux et des Déchets

June 25, 2001

Our File No. 020-08-03-00-00

Manitoba Department of Conservation
Box 19
200 Saulteaux Crescent
Winnipeg, Manitoba
R3J 3W3

ATTENTION: MR. R. HAY, P.ENG., DIKING COMMISSIONER

Dear Mr. Hay:

RE: DIKING COMMISSIONER'S 2000 ANNUAL REPORT

In reply to your letter of January 08, 2001, please find attached the 2000 Flood Activity Report of the Water and Waste Department and the Public Works Department with regard to Flood Pumping Stations and the Diking System within the City of Winnipeg.

Yours truly,

Barry MacBride, P.Eng.
Director

/aed
Attachment

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2000 Flood Activity Report for The City of Winnipeg

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1.0 THE CITY OF WINNIPEG FLOOD CONTROL REPORT

The City of Winnipeg, Water and Waste Department is responsible for the Primary Line of Defence (primary dyking system) and the flood pumping stations within the City of Winnipeg. The following report summarizes the operations of these facilities for the 2000 calendar year.

Throughout the year, the Water and Waste Department's Collection System crews inspected all flood pumping stations once per week. All stations were checked for temperature, basement flooding and vandalism. All problems were repaired as soon as possible.

Commencing in the month of February, all stations were given a complete maintenance check to ensure that these facilities were ready for operation when required. This annual servicing includes:

i) lubricating and operating all positive gates on sanitary, storm and combined sewers;

ii) inspection of all wet well floats;

iii) lubricating and operating of all pumps and equipment within the station;

iv) inspection of all electrical main boxes, starter boxes and motors;

v) inspection of all high voltage transformers and equipment;

vi) inspection of automated control system, where installed.

The Red River's behaviour in 2000 was highly unusual in that no spring high water event was experienced. Despite this, two later peaks occurred during the year 2000, one during the summer, and one during the late fall/early winter season. The Red River reached a peak of 15.6 feet above City datum at James Avenue on July 8th and 9th, 2000. The river then receded to normal summer water level by July 23rd, 2000. The second crest of 12.9 feet above James Avenue Datum was experience from November 14th to 16th inclusive. Beyond November 16th, river levels receded slowly, and a level below 6.5 feet James Avenue datum was not experienced until December 14th. Both the summer high water period, and the second crest in November, were the result of numerous heavy rainfalls throughout the Red River Basin during the summer of 2000. The graph on page 3 illustrates the 2000 high river level events, by plotting daily river levels during the year's high river level period. The table on pages 4 and 5 summarizes the flood activities for 2000. River elevations shown on these tables are in imperial units and are recorded in James Avenue stages.

During October all of the flood pumping stations were winterized in conjunction with the routine weekly checks. However with the November rise in river levels, a second winterizing of the flood pumping stations and gate chambers was undertaken in late November and early December. Twenty-eight (28) of the City's thirty-four flood pumping stations are now automated. All stations are now automated to activation at James Avenue datum elevation 19.0, with one other automated station at 20 feet James. Continued upgrading of the City's flood and lift station alarm and monitoring system also took place in 2000, resulting in improved data availability and offering the potential for enhanced operations. In addition, lighting improvements were made in each of the stations in order to better facilitate maintenance activities. The Water and Waste Department is continuing with its program to evaluate and upgrade the configuration of the flap and positive gates at the automated stations.

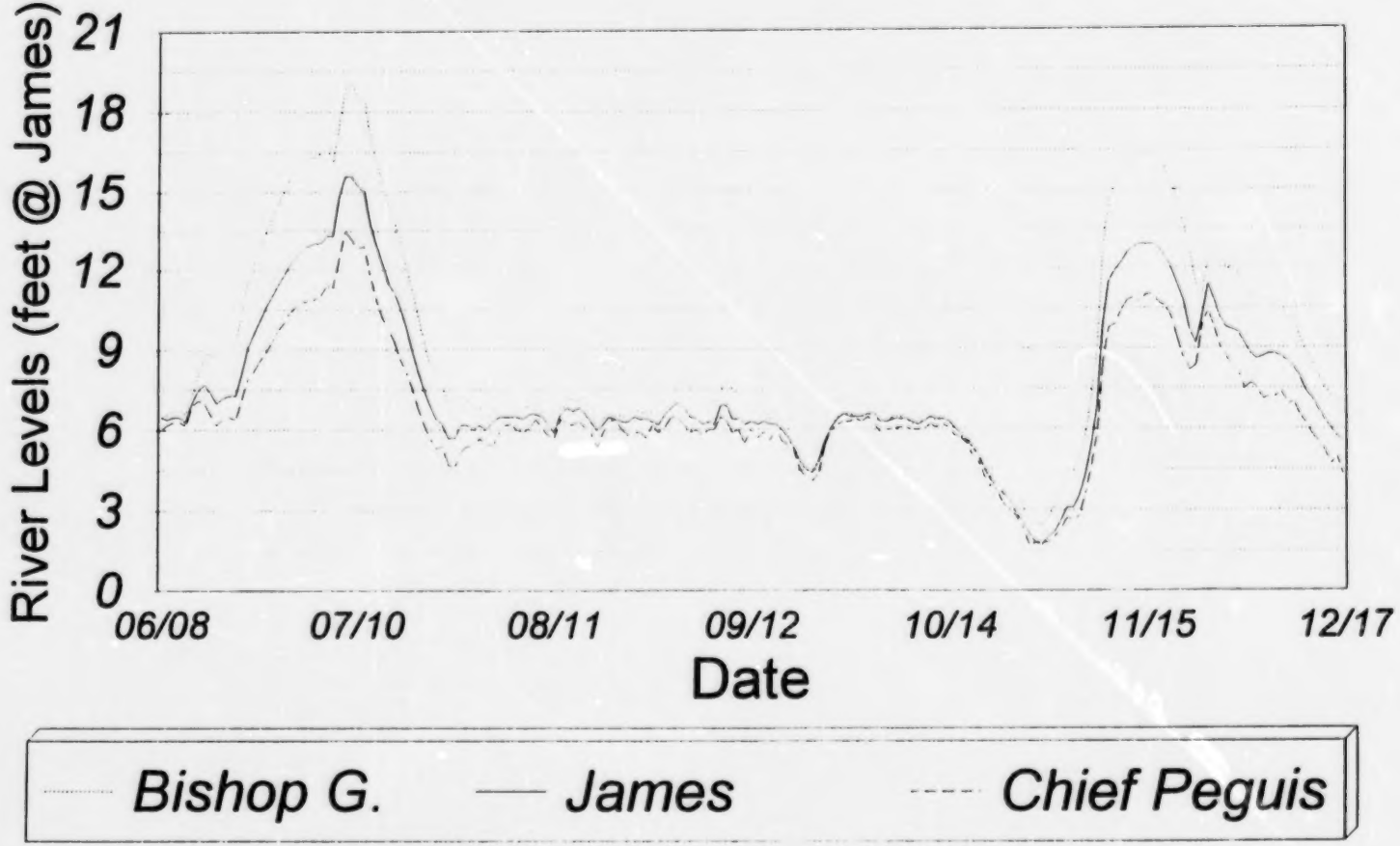
During 2000, river levels were recorded at James Avenue, and the Bishop Grandin (Route 165) and Chief Peguis bridges. Generally, levels are forecast and flood operations proceed on the basis of James Avenue river levels.

Monitoring of some Stormwater Retention Basin levels was undertaken in 2000, specifically in the Whyte Ridge and Bunn's Creek areas. Performance of the Lot 16 Drain and other major channels was excellent in 2000 as no Stormwater Retention Basin drainage difficulties were encountered.

The Water and Waste Department has continued in its efforts to upgrade the information provided in the Flood Control Manual. Furthermore, development of a digitally based Flood Manual commenced in 2000.

2000 FLOOD LEVELS

June 8 - December 17



THE CITY OF WINNIPEG
WATER & WASTE DEPARTMENT
ANNUAL FLOOD ACTIVITY REPORT
2000

FLOOD PUMPING STATION	GATE CHAMBER	ACTIVATION/GATE CLOSED			DEACTIVATION/GATE OPENED		
		DATE	TIME	RIVER ELEV	DATE	TIME	RIVER ELEV
	St. Mary's Rd.	00 06 22 00 11 08	14:25 13:20	9.1 9.8	00 07 19 00 12 03	10:05 09:30	9.0 8.6
	Rainbow Stage	00 06 22 00 11 08	15:15 14:15	9.2 9.8	00 07 19 00 12 03	13:50 10:20	9.0 8.6
	Armstrong Crossover	00 07 19 00 12 03	09:30 10:40	9.0 8.6	00 06 22 00 11 08	13:00 15:10	9.0 9.8
Fort Rouge Park		00 06 22 00 11 08	13:15 11:25	9.1 9.8	00 07 19 00 12 03	10:20 10:10	9.0 8.6
Marion		00 06 13 00 11 07	15:10 13:10	7.4 7.1	00 07 22 00 12 13	13:40 09:15	6.9 6.7
Despins		00 06 21 00 11 07	14:40 14:00	7.4 7.1	00 07 22 00 12 12	10:25 11:00	6.9 7.1
	St. Norbert X-Kalay	00 06 22 00 11 08	09:30 11:20	9.1 9.8	00 07 19 00 12 03	09:10 10:30	9.0 8.6
	Wildwood Golf Course	00 06 23 00 11 08	09:25 10:20	9.6 9.8	00 07 20 00 12 06	13:10 14:20	8.2 8.8
	Aubrey (storm)	00 07 05	13:10	13.3	00 07 14	10:35	12.2
	Ruby	00 07 05	12:30	13.3	00 07 17	11:55	12.2
	Trappiste @ Pembina	00 06 29 00 11 11	09:45 10:25	12.2 12.2	00 07 14 00 11 19	10:10 14:20	12.2 12.0
Baltimore		00 07 05	10:50	13.3	00 07 13	09:10	12.9
LaVerendrye		00 06 23 00 11 08	10:40 13:45	9.6 9.8	00 07 19 00 12 01	11:20 08:50	9.0 9.2
Jefferson		00 06 29 00 11 11	14:40 12:50	12.3 12.2	00 07 15 00 11 20	11:05 10:00	11.5 11.4
Linden		00 06 29 00 11 11	10:20 09:30	12.3 12.2	00 07 16 00 11 20	14:35 08:25	11.1 11.4
Mager Dr.		00 06 29 00 11 09	14:00 14:50	12.3 11.5	00 07 15 00 11 20	09:35 09:45	11.5 11.4
Metcalfe		00 06 29 00 11 09	14:45 13:00	12.3 11.5	00 07 15 00 11 20	10:30 11:40	11.5 11.4

THE CITY OF WINNIPEG
WATER & WASTE DEPARTMENT
ANNUAL FLOOD ACTIVITY REPORT
2000

FLOOD PUMPING STATION	GATE CHAMBER	ACTIVATION/GATE CLOSED			DEACTIVATION/GATE OPENED		
		DATE	TIME	RIVER ELEV	DATE	TIME	RIVER ELEV
	Burrows	00 07 04	11:00	13.0	00 07 12	10:00	13.7
	Eccles (old 750mm SRS)	00 07 04	09:30	13.0	00 07 12	09:45	13.7
	McDermot	00 07 04	13:00	13.0	00 07 12	13:20	13.7
	Pembina & Minerva	00 07 03	11:00	13.0	00 07 13	10:30	12.9
Cockburn		00 07 05	11:20	13.3	00 07 13	09:25	12.9
Newton		00 07 05	11:50	13.3	00 07 13	09:00	12.9
Archibald Underpass		00 07 07	15:00	15.0	00 07 11	13:50	15.0
Bannatyne		00 07 07	10:00	14.5	00 07 12	13:40	13.7
	Bredin Drive (set up pump)	00 06 26	10:45	11.0	00 07 12	13:50	13.7
	Canora	00 07 07	15:20	14.8	00 07 12	09:40	13.7
Hart		00 07 07	10:20	14.5	00 07 12	11:20	13.7
Syndicate		00 07 07	14:45	14.5	00 07 12	10:50	13.7
Dumoulin		00 07 07	14:00	15.3	00 07 12	09:25	13.7
Galt		00 07 07	15:15	15.3	00 07 07	10:15	13.7
	Chataway	00 07 03	11:10	13.0	00 07 11	13:00	15.0

2.0 EXTENSIONS AND REDESIGNATIONS OF THE PRIMARY LINE OF FLOOD DEFENCE

2.1 East Area

2.1.1 Kildonan Drive Dike - Investigations providing for extension of the Primary Line of Defence north of the Bergen cut-off are on-going, in association with Development applications on the cut-off. On February 13, 1991, the City was granted a dike easement through the lands zoned Park on the Edgewood Estates' property, north of the Bergen cut-off and at the north end of Kildonan Drive. On February 17, 1992, the Diking Commissioner granted approval-in-principle for the designation of lands through Edgewood Estates' property as Primary Line of Flood Defence. Finalization of the easement agreement is pending upon review by the property owner.

During the 1997 Spring Flood event, a permanent earth dike was constructed through the Edgewood Estates' property extending from the Kildonan Drive right-of-way at the South to the existing embankment of the Chief Peguis Trail to the North. In December 1999, the Water and Waste Department requested the Diking Commissioner's approval-in-principle for designation of the dike as per drawings described in Section 3.0.

2.1.2 Canoe Club Condominium Complex - Construction of the proposed condominium necessitated relocation of the Primary Line of Defence (PLD). On January 28, 1992, the Diking Commissioner granted approval-in-principle for the relocation of the PLD. On September 22, 1992, a Supplemental Lease Agreement was executed for the proposed PLD relocation and the existing PLD. Once the Consultant provides an as-constructed drawing, the Water and Waste Department will be proceeding with application for redesignation.

2.1.3 Evans Street Dike - Land acquisition of private lands along the west Seine River bank is essentially complete. Land acquisition negotiations are on-going for private lands along the east Seine River bank. Once secured, the lands will accommodate relocation of the Seine River at a bend, and stabilization and reconstruction of Evans Street from Gareau Street to Deniset Street for its proposed designation as a Primary Line of Defence. Some 200 dwellings and several sewer overflows will be added to the City's flood protection system through this initiative.

2.1.4 Normand Park Development Dike - The most recent extension of the primary dike along the north limit of the Normand Park Development was completed in December, 1989; however deficiencies were only rectified in November, 1992. Certificates were issued for the dikes in the last two of the five developments. In December 1999, the Water and Waste Department requested the Diking Commissioner's approval-in-principle for designation of the dike as per the drawings described in Section 3.0.

2.1.5 St. Anne's Road Dike – In December 1999, the Water and Waste Department requested the Diking Commissioner's approval-in-principle for designation of the dike as per the drawings described in Section 3.0.

2.1.6 St. Mary's Road Dike – In December 1999, the Water and Waste Department requested the Diking Commissioner's approval-in-principle for designation of the dike as per the drawings described in Section 3.0.

2.2 North Area

2.2.1 The Forks Development Dike - A leakage test on the chamber was performed and passed on February 21, 1992. Deficiencies regarding modifications to the top of the structure are still outstanding. The Water and Waste Department will be proceeding with application for redesignation of the dike once final acceptance of the gate chamber is issued.

On June 18, 1993, the Water and Waste Department requested approval-in-principle of a dike realignment as a result of a proposed plaza/archaeological dig site at the Forks. On July 21, 1993, the Diking Commissioner granted approval-in-principle for this relocation. The project proceeded as a plaza in 1997 without the archaeological dig site. Therefore, the primary dike alignment was not relocated. Redesignation with this portion of the dike will be part of the whole Forks Development, as above.

2.2.2 Timber Crib Dike - This dike has been replaced by a new earthen dike, which forms part of the extension of Pioneer Boulevard North of the Provencher Bridge (see Section 5.1.1d)). This work proceeded in late 1998 as part of the construction related to the new baseball facility on the North side of Water Avenue. The Acting Diking Commissioner granted approval for realignment of the Primary Line of Defence on September 14, 1998.

2.3 South Area

2.3.1 Plaza Drive and Adamar Road Dikes - Easements have been secured for the dike between Plaza Drive and Bishop Grandin, and for the dike from Adamar Road to Plaza Drive. The Water and Waste Department has surveyed and will be preparing drawings of a portion of Bishop Grandin Boulevard to link the Plaza Drive dike to the D'Arcy Drive dike. In December 1999, the Water and Waste Department requested the Diking Commissioner's approval-in-principle for designation of the dike as per the drawings described in Section 3.0. This includes the dedesignation of those portions of the dike becoming redundant along Pembina Highway, University Crescent, Agassiz Drive and Glengarry Drive.

2.3.2 St. Norbert Daycare Dike - The St. Norbert Daycare proposed the installation of playground equipment on a portion of the primary dike. The Water and Waste Department provided a drawing showing where the new dike is to be realigned to by-pass equipment. Upon completion of all drawings, this Department will proceed with application for redesignation.

2.3.3 St. Norbert School Dike - During the 1997 Spring Flood event, a permanent earth dike was constructed through the Seine River School Division property extending from the existing dike South of the St. Norbert Cemetery at the East to Rue Campeau to the West. In December 1999, the Water and Waste Department requested the Diking Commissioner's approval-in-principle for designation of the dike as per the drawings described in Section 3.0.

2.3.4 St. Norbert Dike - During the 1997 Spring Flood event, the permanent earth dike was raised from the South end of the Lord Avenue right-of-way to the North end of the Rue St. Pierre right-of-way. The St. Norbert dike as well as the St. Norbert Cemetery and Seine School Division dikes (Section 2.3.3), provides for a continuous length of dike, which will protect in excess of 50 additional properties. The Water and Waste Department will be proceeding with application for designation of the dike once all drawings described in Section 3.0 are complete for this area and easements are secured.

3.0 PRIMARY LINE OF DEFENCE (PLD) MAPPING

The Water and Waste Department is continuing a project initiated in 1986 to produce plan/profile drawings of the City's 115 kilometres of primary dikes. These drawings will update the plan/profiles prepared by the Provincial Water Control and Conservation Branch in 1967 in a modern, revisable format. The drawings will also identify deficiencies in the diking system, location of manholes, pipes, catch basins, outfalls and control chambers which breach the dike, and areas where the dike must be realigned to keep pace with new development. Approximately 120 plan/profile drawings at a scale of 1:2000 will be produced.

Initially, aerial photographic mylars were produced and were to serve as base plans for the project. Underground services, street names, dike alignment, chainages, dike elevations, etc., were to be plotted manually on these aerial mylars. The PLD maps for North East District including cross-section drawings were completed manually. Upon completion of these maps, it was decided that this project shift from conventional drafting into computer aided drafting. Some advantages for the change into AutoCAD are:

1) the base information will be supplied by the City's Property and Development Services Department. This digital data was produced by Property and Development Services for the City's Land Base Information System and is therefore accurate and available at no cost. The provision of this information will expedite drawing production;

2) AutoCAD provides consistency and clarity to the drawings;

3) future revisions to these drawings can be easily updated using AutoCAD;

4) AutoCAD provides the flexibility of plotting drawings accurately at any scale, for example the Operations Department may prefer smaller prints for field use.

The project is divided into 7 drawing series corresponding to the different sides of the Rivers. The entire project is now 100% complete. The Series are described as follows:

- Series 100 contains 16 drawings covering the West side of the Red River from the Forks north to the City limits, and is 100% complete.

- Series 200 contains 8 drawings covering the North side of the Assiniboine River from St. James Street East to the Forks, and is 100% complete.

- Series 300 contains 8 drawings covering the South side of the Assiniboine River from Kenaston Boulevard East to the Forks, and is 100% complete.

- Series 400 contains 28 drawings covering the West side of the Red River from St. Norbert North to the Forks, and is 100% complete.

- Series 500 contains 26 drawings covering the East side of the Red River from the Floodway North to the junction of the Seine River, and is 100% complete.

- Series 600 contains 16 drawings covering the West side of the Seine River from the Floodway North to the junction of the Red River, and is 100% complete.

- Series 700 contains 17 drawings covering the East side of the Seine and Red rivers from the Floodway North to the City limits, and is 100% complete.

Further to the recommendations of the Manitoba Commission Report (June 1998) and the subsequent responses by the Diking Commissioner (1998 Annual Report of the Diking Commissioner – Appendix E), in December 1999, the Water and Waste Department of the City of Winnipeg requested the Diking Commissioner's approval-in-principle for many of the proposed extensions/redesignations to the Primary Line of Defence described in Section 2.0.

4.0 SECONDARY LINE OF DEFENCE (SLD)

The City of Winnipeg actively planned, prepared for and undertook specific flood protection activities as necessary in response to the high river levels and overland flooding in the Spring of 1997. For the "Flood of the Century," the City protected over 800 properties with temporary secondary dikes, most with 8.1 million sandbags and 50 locations with earthfill (600,000 m^3).

As a result of the Canada-Manitoba-City of Winnipeg Agreement on Secondary Diking Enhancements (November, 1999), $11.1 million has been allocated to undertake three initiatives related to permanent secondary dikes. These are:

1) community ring dike sites feasibility study ($400,000);
2) construction of community ring dikes ($6.3 million), and;
3) construction of flood proofing works at individual sites ($4.4 million).

The City of Winnipeg has also drafted a "Secondary Dike By-law" that is intended to protect the integrity of existing permanent dikes and to establish a diking corridor at locations where temporary secondary dikes would be required in an emergency. The latter is intended to prevent obstructions, such as decks or garages, which would impede the timely erection of a temporary dike.

5.0 FLOOD ACTIVITY / EMERGENCY MANUAL

The Water and Waste Department has engaged Professional Engineering Services for the preparation of an overall flood activity and emergency manual for the entire City of Winnipeg which will consolidate and update existing information and develop activities for portions of the City where activity manuals do not currently exist.

The intent of this project is to provide a detailed and comprehensive operations Flood Activity / Emergency Manual for all Combined and Separate Sewer Districts within the City of Winnipeg describing flood activities required such as gate monitoring, gate closures, activation of pumping facilities, installation and activation of temporary pumping facilities, raising primary dikes, erecting secondary dikes at various river stages to ensure proper and prompt action by staff to protect properties from overland and basement flooding for a water elevation corresponding to 25.8 feet James Avenue Datum.

6.0 RESPONSES TO DIKING COMMISSIONER'S QUESTIONNAIRE

The following are the responses from the Public Works Department and the Water & Waste Department:

6.1 Engineering Division – Public Works Department.

6.1.1 For the Reporting Year.

a) There were no difficulties or problems encountered.

b) Taché Avenue between Rue Despins and Avenue de la Cathédrale; roadway resurfacing and retaining wall repairs along with slope stabilization using rock caissons as part of Provincial Flood Assistance Program.

c) There were no new sewer outfall gate structures constructed for the reporting year.

d) Lyndale Drive between Monck Avenue and Claremont Avenue; 100 meter extension of a timber pile retaining wall and related slope stabilization works as part of Provincial Flood Assistance Program.

Henderson Highway at Bunn's Creek; Stabilization of the slope at the Southeast corner of the structure by installation of rock caissons, slope flattening, and installation of riprap at the toe of the embankment as part of the 2000 Capital Budget.

6.1.2 Proposed Plans for Future.

a) Riverbank monitoring will be initialized on the east bank of the Red River at Redwood Bridge in 2001 as a supplement to structure movement monitoring.

b) Continue monitoring existing slope indicators on a rotating scheduled basis.

c) Construction of new Provencher Bridge (2001 to 2003) will include raising the roadway on the west side to primary dyke level (Pioneer Avenue from the new structure to Pioneer Boulevard). In addition slopes will be stabilized (to a minimum Factor of Safety of 1.5) and riprap erosion control will be installed on both banks in the vicinity of the bridge.

c) Waterfront Drive, from Lombard Avenue/Pioneer Boulevard intersection to the Higgins Avenue/ May Street intersection will be constructed from 2001 to 2002. Work will include constructing the roadway as a primary dyke and stabilizing the riverbank to a Factor of Safety level of 1.5.

6.1.3 Riverbank Stability.

a) Riverbank monitoring was undertaken at St. Vital Bridge (Red River) in 2000.

Riverbank monitoring will be undertaken at Henderson Highway (Bunn's Creek) and Kildonan Bridge (Red River) in 2001.

b) Riverbank erosion is monitored by visual inspection at all river crossings on an annual basis. Erosion was unremarkable in 2000.

a) There were no remedial works undertaken or completed.

6.1.4 Availability and Location of Proposed Borrow Pits.

a) There was no change to the availability and location of proposed borrow pits.

6.2 Engineering Division - Water & Waste Department.

6.2.1 Ash Pumping Station
- A new flap gate and chamber was constructed.

6.2.2 Cornish Pumping Station
- A new flap gate and chamber was constructed.

6.3 Local Services Division - Water & Waste Department.

6.3.1 There were no problems encountered with any sewer facilities with respect to high river levels or leaking gates.

6.3.2 There were no repairs were carried out on the sewer system to maintain or improve flood protection.

6.3.3 There were no construction or upgrading projects on any of the sewer outfall structures.

6.3.4 There were no other modifications made to the sewer system or diking system.